5: CUMULATIVE IMPACTS

5.1 Introduction

NEPA requires that agencies consider the cumulative impacts of a proposed action or project. NEPA regulations define a cumulative effect as the effect on the environment that results from the incremental effect of the action when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes the other actions and regardless of land ownership on which the other actions occur. An individual action when considered alone may not have a significant effect, but when its effects are considered in sum with the effects of other past, present, and reasonably foreseeable future actions, the effects may be significant (40 CFR 1508.7 and 1508.8, and FSH 1909.15 Section 15.1).

This cumulative impact analysis considers impacts of the proposed action and other projects that have been proposed, or are reasonably foreseeable to take place in the vicinity of the proposed action. The primary activities considered in the analysis of cumulative impacts are other geothermal projects and other activities in the project vicinity that may occur at the same time as the proposed action.

The geographic area considered for cumulative impacts is generally considered to be a 5- to 8-mile radius from the proposed project area, although boundaries of analysis are dependent upon the type of impact to be assessed. The proposed project would occur in the 2003 spring season (March to June).

The effects of geothermal projects vary with the type of activity (exploration or development, well drilling or power plant operation) and whether the geothermal resource is high temperature or low temperature. High temperature resources usually result in the development of power production facilities. Low temperature resources (such as in the Canby area) usually support direct-use project such as district heating, aquaculture, or food drying, although power can be produced from low temperature resources.

The effects of the activities for construction and operation of the proposed direct use project are described in Chapter 4 of this document. In general, effects of the proposed project include surface disturbance for construction and operation of pipelines, mechanical building, and the food service building. Construction activities create noise and dust; mitigation measures are applied to reduce effects. Pipelines require surface disturbance for the trenching construction activities. Effluent discharge contributes to water quality effects. The surface disturbance and noise results in effects to biological resources; mitigation measures reduce the effects to less than significant levels for all parameters.

5.2 Potential Cumulative Projects

MODOC COUNTY

The cumulative impact analysis considers impacts of the proposed project along with the potential impacts of other projects that are reasonably foreseeable to take place near the proposed project. Modoc County has indicated that there are no approved and un-built or proposed projects in the general vicinity of the proposed Canby Geothermal project that, combined with the proposed project, could be identified as potentially generating cumulative environmental impacts.

OTHER PROJECTS

Bureau of Land Management

There are no activities currently planned within a 10-mile radius of Canby in the nearby BLM lands for early 2003 (Humm 2002).

Modoc National Forest

The following projects were reported by staff to be scheduled in the Modoc National Forest within a 10-mile radius of Canby in the early part of 2003 (Bryan 2002 and Read 2002):

- Timber Sale and Thinning of 1,500 acres in the vicinity of Rail Mountain 4.5 miles northwest of the project area)
- Thinning in the Badger/Eagle area of 300 acres in the Rail Mountain/Duncan Reservoir area, with 30-40 acres to be completed by July 2003 (6.5 miles northwest of the project area)
- Wildlife burning of 80 acres at Washington Mountain between March to May 2003 (4.5 miles west of the project area)
- Underburning of vegetation in the Hackamore area 2 miles north of Westlake Butte by Washington Mountain, with 1,000 of the 2,000 acres to be completed between March to May of 2003 (4.5 miles west of the project area)

These projects have the potential to result in cumulative impacts for traffic and air quality.

Caltrans

There are no road improvement projects currently planned along Highway 299 or 139 in the vicinity of Canby by Caltrans for early 2003 (Fawver 2002).

Kelley Hot Springs

Another ongoing geothermal direct use project is a privately operated aquaculture project at Kelley Hot Springs (KHS). The KHS project utilizes naturally flowing geothermal fluids from the same geothermal reservoir that serves the I'SOT well. The NPDES permit granted by the Regional Water Quality Control Board prescribes conditions for the discharge by the aquaculture project. Geothermal fluid is not actively extracted from the resource for this use and thus these operations do not cause an impact on the geothermal resource. This project does not alter the volume of KHS geothermal waters flowing to the Pit River.

CUMULATIVE IMPACTS

The cumulative impacts of the proposed projects are described below. Measures are proposed as conditions of the project, which would reduce all impacts to less than significant levels. Cumulative effects of the proposed project with other projects identified within a 10-mile radius indicate potential effects only to traffic and air quality.

Air Quality

The air quality study area is generally the air basin. The proposed and cumulative projects would emit PM_{10} from construction and criteria pollutants from cars, trucks, generators, and earthmoving equipment. The project would result in low emissions of pollutants that would be emitted through use of the back-up propane boiler, although implementation of the project would decrease total propane-related emissions in Canby. Emissions from timber burning (4-5 miles away) may travel to the project area. Air emissions from the proposed direct use project would be short-term and temporary and would not be expected to represent a cumulatively significant impact on air quality in the region. Emissions controls on equipment and watering of construction sites for dust control would help avoid the potential for cumulative air quality effects.

The Kelley Hot Springs geothermal project would not have a cumulative effect on air quality because the proposed and existing direct-use geothermal projects not involve significant air emissions during operation.

Geology, Soils, and Mineral Resources

The study area for the project is the Modoc Plateau. There are no approved and un-built or proposed projects identified in the general vicinity of the proposed Canby Geothermal project that would combine with the proposed project to create cumulatively significant impacts to geology or soils.

Hydrology and Geothermal Resources

Surface water. The project study area for surface water is the Warm Springs Valley Drainage Basin, a sub-basin of the Pit River Basin. The proposed project would cumulatively contribute pollutants to the Pit River. Kelley Hot Springs (KHS) is approximately 2 miles upstream from the proposed discharge point and releases approximately 400 gpm of geothermal fluid into the Pit River. The proposed Canby project includes mitigation measures to minimize contaminants in the discharge and the project will meet the requirements of the RWQCB to protect water quality. The KHS geothermal fluid contains mercury and arsenic levels above what is expected to be discharged from the proposed project after mercury abatement. Since the volume of the proposed discharge is very small (less than 60 gpm and approximately 10 percent of that of KHS) and levels of both mercury and arsenic are lower in the

proposed project discharge, this project is not expected to have a significant cumulative impact on Pit River water quality.

Groundwater. The project study area for groundwater is the Alturas Groundwater Basin. The proposed project does not include use of potable groundwater. The project would not contribute to groundwater use in the region. The proposed project includes measures to avoid groundwater contamination and would not cause a cumulative effect on groundwater.

Geothermal Resources. The project geothermal resource study area aquifer is considered to extend from Kelley Hot Springs to Canby. The only geothermal project in the region that may combine to have cumulative impacts would be the project at Kelley Hot Springs. The Kelley Hot Springs project only uses geothermal fluids that are naturally discharged. The proposed project has only a small withdrawal of geothermal fluids (less than 60 gpm) and would not cumulatively combine to cause a significant adverse effect on the geothermal resource.

Biology

The biological cumulative impact study area would be a 10-mile radius from the town of Canby. The proposed action would result in the surface disturbance of approximately 13.8 acres, much of which has been previously disturbed by farming operations. The temporary loss of 0.03 acres of wetland would not cumulatively contribute to the loss of wetlands in the region. The proposed project would not represent a significant additive effect to that of the timber projects because there is no timber affected. The cumulative loss of habitat from the proposed project is not a significant loss of habitat because of the abundance of similar habitat in the region. The proposed mitigation measures would further reduce or minimize any potential habitat impacts. The proposed project would not add a significant effect to cumulative impacts to vegetation and wildlife in the area.

The proposed project would be adding additional mercury to the Pit River downstream of Kelley Hot Springs; however, the additional discharge amount is less than significant and is not expected to harm bald eagles or other wildlife. Mitigation measures will be carried out to monitor mercury levels in the water and in fish tissue to prevent mercury limits that could cause an adverse effect from being reached. The cumulative contribution of mercury to the Pit River would result in less than significant effects on fish and wildlife.

Cultural Resources

Archaeological and Historic Resources. The area of cumulative effect is the Canby project study area. The proposed action would not affect any known archaeological or historic resources. No tribal sacred sites have been identified in the project area in a search performed by the California Native American Heritage Commission. The mitigation is designed to ensure avoidance of cultural resource or sites (if they are identified) so that no adverse effect to cultural resources can occur from implementation of the proposed project.

An effect to resources at this site, if it occurs, would not be cumulatively significant because mitigation would be implemented. The proposed project would not contribute to cumulative effects to resources in the vicinity of Canby or the Pit River. The project would not contribute to a cumulative effect on cultural resources in the region.

Traditional Cultural Values. The study area for cumulative effects to traditional cultural values includes the Pit River area. Native American groups have expressed concern about geothermal activities in the region. Pit River Tribe members indicated that alterations in the existing environment associated with the district heating project could constitute effects on the cultural integrity of the sites if identified. There are no identified traditional cultural properties in the Canby project area; therefore no cumulative impacts to site access or integrity are anticipated.

Land Use, Agriculture, and Recreation

Land Use. The land use study area is Modoc County. The construction effects of the district heating system are short-term and temporary and would not result in a cumulatively significant impact on existing, farming, ranching, or other land uses in the area. The district heating project would not represent new land use in the area since other geothermal projects have been and continue to be underway. Direct use geothermal projects are consistent with the existing Modoc County General Plans.

Agriculture. The study area for agricultural and farmland effects would be Modoc County. The district heating system would result in short-term and temporary impacts to agricultural lands due to construction of the pipeline. The temporary effects due to installation of the pipeline in pastureland are less than significant. Construction would occur over an approximately three-month period and include coordination with the local rancher. The pipeline would be buried at a depth of 3 ft., which would not interfere with normal agricultural practices in the project area. No other projects are planned that would affect agriculture, so there would be no significant cumulative impact on agriculture.

Recreation. The study area for recreation would be the town of Canby. The proposed project would have no effect on recreation within the project area.

Noise

The project study area for noise would be within a 2-mile radius of the project. The project would produce short-term and localized construction noise. Cumulative noise generated from traffic during construction would not significantly affect ambient noise along access routes. Project operation would produce minimal amounts of noise only audible within the project area. There are no projects in the area that would combine with the proposed project to cause a cumulative effect.

Infrastructure

The infrastructure study area would be Modoc County. Section 4.8, Infrastructure and Service Systems, presented the conclusion that implementation of the proposed action would not impact utility or service systems. The proposed project, in combination with cumulative projects would not result in significant adverse cumulative impacts to public services, including police, schools, fire protection, emergency services, water supply, sanitary sewer, sold waste or public utility systems. The proposed project would not bring long-term residents to the area and therefore would not cause a cumulative increase in the demand for services.

Aesthetics

The visual resource study area would be the town of Canby and the surrounding vantage points. The surface disturbance for the discharge pipeline would be visible from County Road 54. State Route 299 would be crossed during boring for the discharge pipeline, but effects to visual resources would be

minor and temporary (for less than one week). The district heating system would not result in a significant cumulative aesthetic effect in the project area because no other projects have been identified as planned for construction in the same timeframe and the project would not contribute substantial new construction that would result in permanent effect on the visual landscape.

The areas of disturbance for the proposed action are several miles from long-range viewpoints and would be difficult to distinguish from that distance. The contribution of the proposed action is considered minor because the existing well site and the farmland has been cleared of vegetation during previous farming operations.

Socioeconomics

The study area for socioeconomic impacts would by Modoc County. The proposed project would have very limited effects on the socioeconomics of the region. The workers that stay in the area would temporarily contribute to the local economy. Economic benefits from reducing energy costs would be limited to the I'SOT community. The cumulative impacts would not be significant. The proposed project would not disproportionately affect Native Americans or any other low-income or minority population in the area by itself or in combination with other projects.

Transportation Systems

The project study area for traffic effects is a 10-mile radius from the project. The proposed project would add to the cumulative traffic on the surrounding county roads and SR 299 during construction. The project traffic effects would be minimal and temporary in nature.

The project may coincide with the timber sale, thinning, and burning activities north and west within a 10-mile radius of the proposed project during construction in early 2003. The timber activity traffic and the project access would both use SR 299. The direct use project traffic would use County Road 54, 83, 161, and 203 to bring in the equipment and workers to the Canby District Heating project area. Most of the project traffic would be passenger cars traveling daily to the parking area site on SR 299 and equipment traffic along County Roads 54, 83, 161, and 203. The proposed project construction would occur over a period of approximately 70 days. An Encroachment Permit from Caltrans includes conditions for the boring activity at SR 299. A potential for damage to road integrity could occur from boring under SR 299; however the cumulative traffic effect of the proposed project would not be significant. The incorporation of Mitigation Measures 4.11-1 and 4.11-2 would reduce the traffic impact of construction to less than significant and would not result in a substantial contribution to cumulative traffic in the region.

Human Health and Safety

The project study area for hazards would be Modoc County. Cumulative risk of fire is not anticipated to result from the project, as fire prevention measures would be employed during project implementation. Other projects within the study area would involve vegetation burning. Fire prevention measures that the project proponents would employ would reduce the risk of fire. All projects would adhere to Modoc County requirements and would be subject to the emergency fire response programs.

Transport of hazardous materials for all projects within 10 miles would be subject to county and other regulations pertaining to transport and storage of regulated materials. A licensed vendor would handle

transport of mercury from the project area. Cumulative risk from transport of hazardous materials is not anticipated for the project.

The proposed project would not have cumulative effects on human health and safety due to the regulations and procedures in place to minimize effects. The discharge pipeline would be monitored monthly to check for leaks. After a seismic event, the pipeline would be checked immediately for potential breakage to minimize effects to human health and safety.

CUMULATIVE EFFECTS OF ALTERNATIVES

The No Action alternative would avoid all contributions to cumulative effects in the project area if the project could not find additional funding. The project may go forward without DOE funding; the effects of this alternative would be the same as the proposed action.

CONCLUSION

The proposed project would have a less than significant contribution to cumulative impacts within the Canby project study area.